UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/574,812 | 04/05/2006 | M. Jayasheela | 021958000110US | 3656 |

20350 7590 10/17/2008

TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

| EXAMINER | |
|---|---|
| DUNSTON, JENNIFER ANN | |
| ART UNIT | PAPER NUMBER |
| 1636 | |
| MAIL DATE | DELIVERY MODE |
| 10/17/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/574,812 | JAYASHEELA ET AL. | |
| | Examiner | Art Unit | |
| | Jennifer Dunston, Ph.D. | 1636 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *1-6,9,10,13-21,24 and 25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,8,11,12,22 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

Claims 1-25 are pending in the instant application.

### *Election/Restrictions*

Applicant's election with traverse of Group IV in the reply filed on 7/11/2008 is acknowledged. The traversal is on the ground(s) that groups I-V are all directed to a defined-dose therapeutic phage, methods of making a defined dose-therapeutic phage, and methods of using the defined-dose phage. Further, the response asserts that the Office action does not include a reasoning for selecting the host bacterium as the special technical feature rather than selecting the defined-dose phage. This is not found persuasive. The first named invention is a method of making a non-replicating anti-bacterial phage, comprising producing said anti-bacterial phage in a host production bacterium (Group I). The first named product is the host production bacterium (Group II), and this product is used in the first named method. However, Fairweather (Infection and Immunity, Vol. 41, No. 3, pages 1112-117, September 1983; e.g., Table 1) teach host strain RN4220, which is disclosed in the present specification as a host production strain (e.g., paragraph [0174]). Therefore, the technical feature does not make a contribution over the prior art and does not constitute a special technical feature. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims. See 37 CFR 1.475(d). Accordingly, the restriction between Groups I-V is proper.

Even if the technical feature linking the groups was considered to be the therapeutic phage, this feature is not a contribution over the prior art and thus is not a special technical feature. Bläsi (WO 02/34892 A1; see the entire reference) teaches therapeutic phage that comprise a non-replicative modification in the genome, where "non-replicative" means any modification in the phage genome whereby such a modified phage does not replicate (e.g., page 9, last paragraph).

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-6, 9, 10, 13-21, 24 and 25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7/11/2008.

An examination on the merits of claims 7, 8, 11, 12, 22 and 23 follows.

### *Information Disclosure Statement*

Receipt of an information disclosure statement, filed on 6/26/2006, is acknowledged. The signed and initialed PTO 1449 has been mailed with this action.

### *Oath/Declaration*

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The full name of each inventor (family name and at least one given name together with any initial) has not been set forth. The full given name is not provided for M. Jayasheela. There is no indication on the oath or declaration that the singular lettering set forth is the inventor's given name. Thus, "M" is considered an abbreviation of the inventor's given name.

***Specification***

The disclosure is objected to because of the following informalities:

1. Page 9 contains the heading "BRIEF DESCRIPTION OF THE DRAWINGS"; however, the application does not contain any drawings.

2. The citation at page 20, line 19 is incomplete. The "xx" should be replaced with a page number.

3. The sentence ending at page 20, line 11 is incomplete, because is does not end in a period.

Appropriate correction is required.

The use of the trademark PROVENTIL (paragraph [0133]) has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

***Claim Objections***

Claims 7, 8, 11, 12, 22 and 23 are objected to because of the following informalities: each of the claims depends from a withdrawn claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7 and 8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for administering a therapeutically effective amount of a pharmaceutical composition comprising an anti-bacterial phage, wherein said anti-bacterial phage inhibits growth of a target bacterium, and wherein said anti-bacterial phage has diminished replication activity in said target bacterium, does not reasonably provide enablement for administering a prophylactically effective amount of a pharmaceutical composition comprising an anti-bacterial phage, wherein said anti-bacterial phage inhibits growth of a target bacterium, and wherein said anti-bacterial phage has diminished replication activity in said target bacterium. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Enablement is considered in view of the Wands factors (MPEP 2164.01(A)). These include: nature of the invention, breadth of the claims, guidance of the specification, the existence of working examples, state of the art, predictability of the art and the amount of experimentation necessary. All of the Wands factors have been considered with regard to the instant claims, with the most relevant factors discussed below.

*Nature of the invention:* The claims are drawn to a method of treating a bacterial population in a subject, said method comprising administering a prophylactically effective amount of a composition, which is a pharmaceutical composition comprising an anti-bacterial phage, wherein said anti-bacterial phage inhibits growth of a target bacterium, and wherein said anti-bacterial phage has diminished replication activity in said target bacterium. Claim 8 limits the subject to a human, primate, or a food, work, display or companion animal. The nature of the invention is complex in that the claims require a "prophylactically effective" amount o the composition. Thus, the composition must be capable of preventing a bacterial infection.

*Breadth of the claims:* The claims are specifically directed to prophylaxis of bacterial infection. However, the claims are broadly drawn to the prophylaxis of any bacterial infection in any subject.

*Guidance of the specification and existence of working examples:* The specification envisions the administration of anti-bacterial phage for prophylaxis of bacterial infection (e.g., paragraphs [0021], [0040], [0058] and [0082]). The specification defines the term "bacterial infection" to mean the growth of bacteria (paragraph [0058]). Thus, prophylaxis of a bacterial infection requires the complete prevention of bacterial growth.

The specification does not provide any working examples that demonstrate the effective prophylaxis of a bacterial infection in any subject.

*Predictability and state of the art:* It would have been an unpredictable venture to provide a prophylactically effective amount of an anti-bacterial phage to a subject to prevent the growth of bacteria in the subject. Levin et al (Nature Reviews Microbiology, Vol. 2, pages 166-173, February 2004) teach that phage can control bacterial population in therapeutic settings but must

be maintained at sufficient densities to reduce the rate of replication of the infecting population of bacteria, and must reach the site(s) of infection and have access to the bacteria when they are susceptible—non-replicating populations of bacteria are refractory to killing by most phages (e.g., page 167, paragraph bridging left and middle columns). Thus, if a bacterial population is present in a subject, it will likely divide and grow prior to killing by the administered dose of phage.

*Amount of experimentation necessary:* Given the lack of guidance in the specification and prior art with regard to complete prevention of bacterial replication by a therapeutic phage, it would require a large amount of experimentation to practice the full scope of the claimed invention. One would be required to identify therapeutic phage that are capable of infecting non-dividing bacteria. Next, one would need to determine whether administration of the phage to a subject such as a human, primate, or food, work, display or companion animal results in complete inhibition of bacterial growth.

In view of the breadth of the claims and the lack of guidance provided by the specification as well as the unpredictability of the art, the skilled artisan would have required an undue amount of experimentation to make and/or use the claimed invention for prophylaxis. Therefore, claims 7 and 8 are not considered to be fully enabled by the instant specification.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7, 8, 11, 12, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Bläsi (WO 02/34892 A1; see the entire reference).

Regarding claim 7, Bläsi teaches a method of treating a bacterial infection in an organism, comprising administering a pharmaceutical preparation of a phage (e.g., page15, paragraphs 2-3). The phage are used in phage therapy to effectively kill specific bacteria and avoid undesired side effects, e.g., release of cell debris (e.g., page , paragraph 5). Bläsi teaches the use of phage that comprise a non-replicative modification in the genome, where "non-replicative" means any modification in the phage genome whereby such a modified phage does not replicate (e.g., page 9, last paragraph).

Regarding claim 8, Bläsi teach the method where the phage is used to treat a bacterial infection caused by a target bacterium, where the target bacterium is *Staphylococcus aureus* (e.g., page 15, paragraphs 2-3).

Regarding claim 11, the specification defines the term "genetically incompetent" to mean loss of replication activity (paragraph [0051]). Bläsi teaches a method of treating a bacterial infection in an organism, comprising administering a pharmaceutical preparation of a phage (e.g., page15, paragraphs 2-3). The phage are used in phage therapy to effectively kill specific bacteria and avoid undesired side effects, e.g., release of cell debris (e.g., page , paragraph 5). Bläsi teaches the use of phage that comprise a non-replicative modification in the genome, where "non-replicative" means any modification in the phage genome whereby such a modified phage does not replicate (e.g., page 9, last paragraph).

Regarding claim 12, Bläsi teach the method where the phage is administered in combination with a second anti-bacterial agent (e.g., page 14, 4th full paragraph).

Regarding claim 22, Bläsi teaches a method of treating a bacterial infection in an organism, comprising administering a pharmaceutical preparation of a phage (e.g., page15, paragraphs 2-3). The phage are used in phage therapy to effectively kill specific bacteria and avoid undesired side effects, e.g., release of cell debris (e.g., page , paragraph 5). Bläsi teaches the use of phage that comprise a non-replicative modification in the genome, where "non-replicative" means any modification in the phage genome whereby such a modified phage does not replicate (e.g., page 9, last paragraph). Because the phage are non-replicative, they will necessarily exhibit less than 20% DNA or phage replication activity in the target bacterium when compared to the intact parental phage or prophage.

Regarding claim 23, Bläsi teach the method where the phage is used to treat a bacterial infection caused by a target bacterium, where the target bacterium is *Staphylococcus aureus* (e.g., page 15, paragraphs 2-3).

## ***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Dunston whose telephone number is 571-272-2916. The examiner can normally be reached on M-F, 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached at 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer Dunston, Ph.D.
Examiner
Art Unit 1636

/JD/

/Celine X Qian Ph.D./
Primary Examiner, Art Unit 1636